

A LESION NEMATODE, Pratylenchus zeae

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Pratylenchus zeae Graham, 1951, one of the root lesion nematodes, is a migratory endoparasite of roots. It was first observed by T. W. Graham (10), who, in the 1940s, noticed that lesion nematodes were associated with a root rot of tobacco in the states of North Carolina, South Carolina, and Georgia. Two types of lesion nematodes were associated with the tobacco roots and were identified as new species, one of which was Pratylenchus zeae.

GEOGRAPHIC DISTRIBUTION: Pratylenchus zeae has been reported from California, Texas, Louisiana, and the southeastern United States (2, 10, 11). It is most commonly distributed throughout tropical parts of the world (18). In addition to the United States, P. zeae has been reported from Australia, Brazil, Cuba, Egypt, Hawaii, Ivory Coast, India, Iraq, Japan, Madagascar, Nigeria, Panama, Puerto Rico, Rhodesia, South Africa, Senegal, Trinidad, United Arab Republic, and Venezuela (3, 4, 9, 12, 13, 17, 18, 19, 23).

HOSTS: Pratylenchus zeae is a pest of many food crops and has been associated with damage to the roots of corn, rice, sugarcane, peach, and sorghum (1, 3, 5, 9, 12, 13, 20, 21, 23). Additional plants reported to be parasitized by this nematode include tobacco, turfgrasses, crabgrass, onions, wheat, rye, barley, citrus, soybean, sweet potato, and strawberry (5, 6, 7, 8, 9, 10).

SYMPTOMS AND PATHOLOGY: Corn seedlings planted in sterilized soil showed stunting 2 weeks after exposure to a heavy infestation of P. zeae (22). Investigators observed the nematodes penetrating the roots in the root hair zone and at the points of emergence of lateral roots from the main roots (18). Nematodes invaded preferred sites in large numbers and fed within the cortex and on the lateral root initials within the main root.

Symptoms of damage to plants include stunting, wilting, and yellowing of the leaves (1, 9, 14, 15). Roots may be stunted or sparse and display brown lesions which are followed by decay (10, 16, 20, 21). Roots may break away when plants are removed from the soil (9).

SURVEY AND DETECTION:

1) Examine the top parts of plants for stunting, yellowing, wilting, or general unthriftness. Examine roots for sparseness, rot, or lesions.

2) Submit approximately one pint of combined soil and roots to a nematology laboratory, exercising care to prevent drying or overheating.

LITERATURE CITED

1. Allow, J. M., and Z. A. Katcho. 1967. Nematode infestation of sugarcane in Iraq. Plant Dis. Reprtr. 10:809.
2. Ayoub, S. M. 1961. Pratylenchus zeae found on corn, milo, and three suspected new hosts in California. Plant Dis. Reprtr. 45:940.
3. Chevres-Roman, R., H. D. Gross, and J. N. Sasser. 1971. The influence of selected nematode species and number of consecutive plantings of corn and sorghum on forage production, chemical composition of plant and soil, and water use efficiency. Nematologica 1:40-41, 46. (Abstr.)
4. Colbran, R. C. 1955. A preliminary survey of plant nematodes in Queensland. J. Austr. Inst. Agric. Sci. 21:167-169.
5. Endo, B. Y. 1959. Responses of root-lesion nematodes, Pratylenchus brachyurus and P. zeae to various plants and soil types. Phytopathology 49:417-421.
6. Endo, B. Y. 1967. Comparative reproduction of Pratylenchus brachyurus and P. zeae in corn and soybean varieties 'Lee' and 'Peking'. Nematologica 13:140-141. (Abstr.)
7. Eriksson, K. B. 1972. Nematode diseases of pasture legumes and turfgrasses, p. 66-96. In Economic Nematology. J. M. Webster [ed.], Academic Press, New York. 563p.
8. Esser, R. P. 1978. Citrus survey, p. 112-118. In 32nd Biennial Report, Division of Plant Industry, Fla. Dept. Agric. and Consumer Services, 1976-1978.
9. Fortuner, R. 1976. Pratylenchus zeae. C.I.H. Descriptions of Plant-parasitic Nematodes, Set 6, No. 77. Commonwealth Institute of Helminthology. London.
10. Graham, T. W. 1951. Nematode root-rot of tobacco and other plants. South Carolina Agric. Exp. Sta. Bul. 390. Jan. 1951. 25p.
11. Harrison, A. L. 1952. Plant disease notes from Texas. Plant Dis. Reprtr. 12:491.
12. Holtzman, O. V. 1968. Plant-nematode associations previously unreported from Hawaii. Plant Dis. Reprtr. 52:515-518.
13. Jensen, H. J. 1972. Nematode pests of vegetable and related crops, p. 377-408. In Economic Nematology. J. M. Webster [ed.], Academic Press. New York. 563p.
14. Khan, S. A. 1959. Pathogenic effects of Pratylenchus zeae on sugarcane. Phytopathology 59:543. (Abstr.)
15. McElroy, F. D. 1972. Nematodes of tree fruits and small fruits, p. 335-376. In Economic Nematology. J. M. Webster [ed.], Academic Press. New York. 563p.
16. Nath, R. P., M. G. Haider, B. K. Sinha, and A. C. Sinha. 1978. Growth responses of sugarcane to Pratylenchus zeae. Indian J. Nematol. 8:165-167.
17. _____, G. Swarup, and A. B. Prasad. 1975. Studies on the morphology and cytology of Pratylenchus zeae with a report on the occurrence of its male. Indian J. Nematol. 5:123-125.
18. Olowe, T., and D. C. M. Corbett. 1976. Aspects of the biology of Pratylenchus and P. zeae. Nematologica 22(2):202-211.
19. Oteifa, B. A. 1962. Species of root lesion nematodes commonly associated with economic crops in the delta of the U.A.R. Plant Dis. Reprtr. 46:572-575.
20. Prasad, S. K. 1972. Nematode diseases of sugarcane, p. 144-158. In Economic Nematology. J. M. Webster [ed.], Academic Press. New York. 563p.
21. Singh, N. D. 1974. Nematode pests of sugarcane new to Trinidad. Plant Dis. Reprtr. 58:122.
22. Tarte, R. 1971. The relationship between pre-plant populations of Pratylenchus zeae and growth and yield of corn. J. Nematology 3:330-331. (Abstr.)
23. Tikyani, M. G., and S. Khera. 1968. A survey of plant parasitic nematodes around roots of great millet (Sorghum vulgare) from Rajasthan, India. Plant Dis. Reprtr. 52:396-398.